Water Treatment

- Intake
- Rapid Mix
- Flocculation
- Sedimentation
- Storage
- Disinfection
- Filtration
Intake

Description
Water is essential to the survival of most living things, and assuring clean water is a top priority for more than 50,000 community water systems in the United States alone. This process begins with flowlines that take water from lakes, rivers and reservoirs and pump it to a treatment plant.

Bearing Applications
Housed bearing units are used in sluice gates and ball bearings in the pumps at pumping stations
Rapid Mix

Description
Water coming into the treatment plant goes through a coarse screen to keep out debris. Then coagulant (e.g. aluminum sulfate, iron chloride) is added to help solids agglomerate, or clump together. Air is pumped in to mix the coagulants at high speed.

Bearing Applications
Mixers typically use sleeve bearings, while fans and blowers feature housed bearing units (e.g. split-to-the-shaft). The pumps have ball bearings.

Items to Consider
Most submerged applications use sleeve bearings.
Flocculation

Description
The water is gently stirred in flocculators to help coagulated particles cling together to form larger particles, known as “floc.” This is done with paddles (20 on a shaft is not uncommon) in one of five arrangements: horizontal paddle wheel, vertical paddle wheel, walking beam, oscillating, or impeller.

Bearing Applications
Housed bearing units (e.g. split-to-the-shaft) connect paddle shafts in a series and provide vital support. These applications can require as many as 100 bearings. On vertical paddle wheels, where the bearings may be submerged, sleeve bearings are common.

Items to Consider
In some flocculators, such as the horizontal design, the bearings are submerged in the water and should use a lubricant that is moisture-repellant. Corrosion resistance is also important, especially as the use of ferric chloride as a floculant becomes more common.
Sedimentation

Description
Water and floc are pumped to a sedimentation tank, where the floc settles on the bottom so it can be discharged and thickened and dried for disposal. Drag screens help separate the floc from the water, which exits through a sluiceway near the top of the tank.

Bearing Applications
The pumps use ball bearings, while the drag screens typically have chain-and-sprocket drives with sleeve bearings. The jack shaft, or support shaft, of a sludge collector has ball bearings or roller bearings.

Items to Consider
The drag screen drives are underwater, so their sleeve bearings are generally made of nylon or polyethylene.
Filtration

Description
Any particles remaining in the water are filtered out thorough filter beds of sand, gravel and/or activated charcoal.

Bearing Applications
The pumps that move the water into and out of the filtration stage use ball bearings.
Disinfection

Description
Small amounts of chlorine are added to kill any bacteria or microorganisms. If the water will be used for drinking, fluoride is added to fight tooth decay.

Bearing Applications
Ball bearings are used in the pumps at pumping stations.
Storage

Description
Purified water is pumped from the treatment plant to water towers or reservoirs, sometimes called clearwells, to be stored until needed. From there it enters the distribution system that takes it to local residences and business.

Bearing Applications
Ball bearings are used in the pumps at pumping stations.
## Water Treatment Applications

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